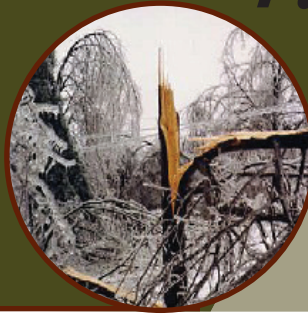




# Forest Health

## MAINE

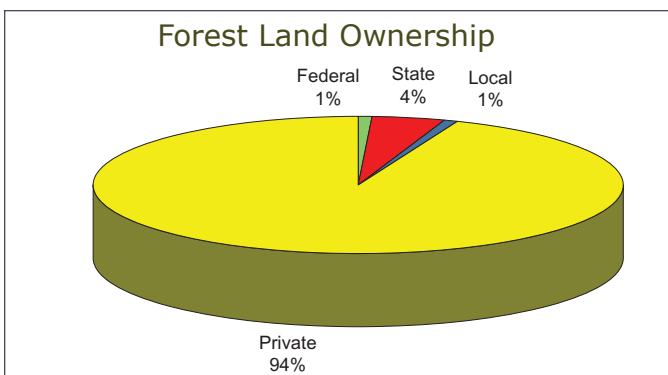
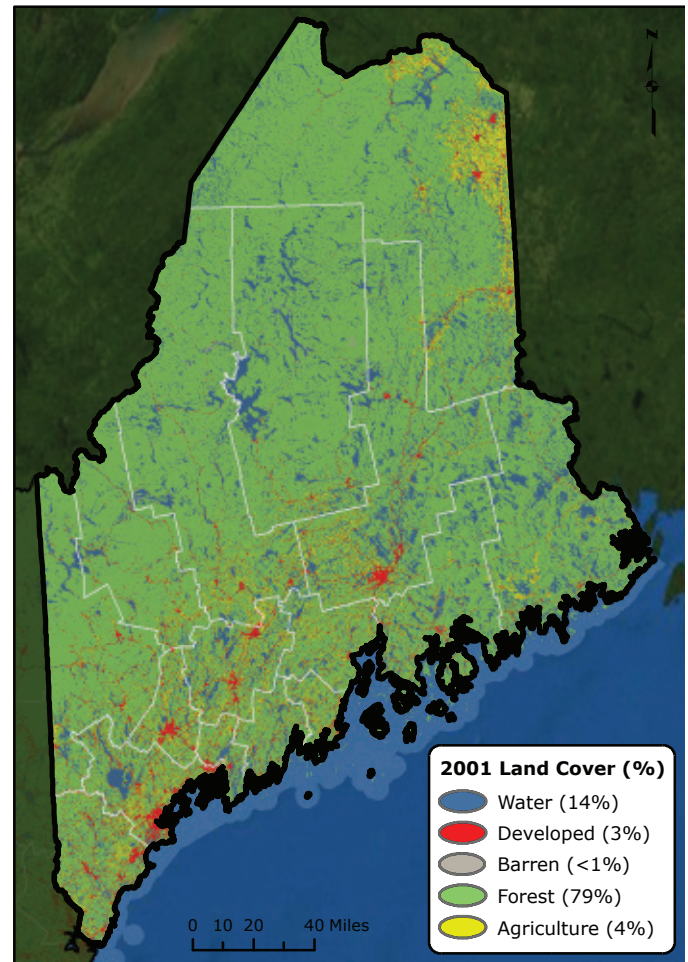
### *highlights*



## Forest Resource Summary

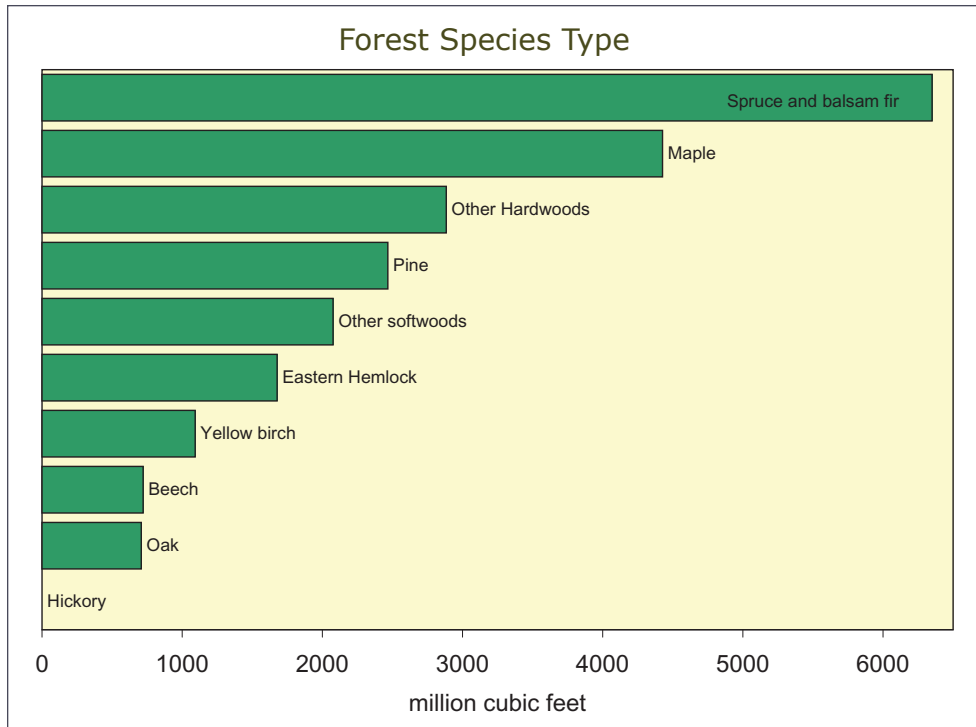
Almost all of the forest lands in Maine are privately owned—approximately 94 percent—with only 1 percent in Federal ownership that encompasses the eastern portion of the White Mountain National Forest. The latest Maine forest inventory estimates that 79 percent of Maine is forested, approximately 17.7 million acres. The forest resource is made up of a variety of forest types, mostly spruce and balsam fir, maples, other hardwoods, and pine.

Maine's forests provide much of the raw materials to fuel the State's mills and serve as the backdrop for the recreation industry. These forest-based industries employ more than 12 percent of Maine's workforce and generate more than 11 percent of the State's payroll. The overall annual contribution of the forest resource to Maine's economy exceeds \$8.5 billion. The forests of the State also provide watershed, environmental, wildlife, and recreational benefits. Forested parks and individual shade trees provide similar amenities in urban and suburban settings.



## Forest Health Programs in the Northeast

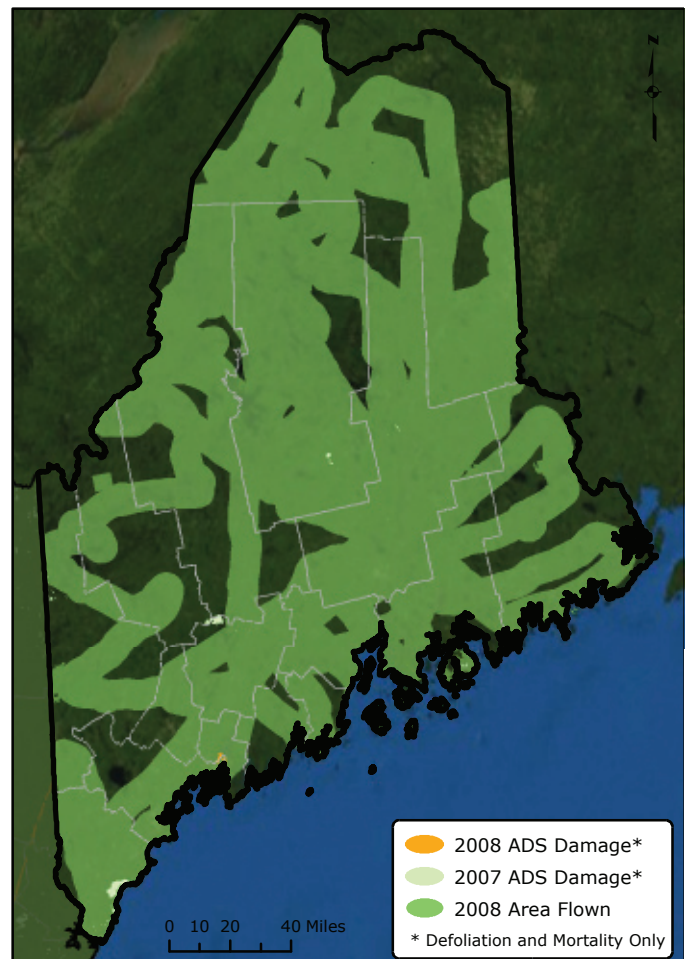
State forestry agencies work in partnership with the U.S. Forest Service to monitor forest conditions and trends in their State and respond to pest outbreaks to protect the forest resource.



## Aerial Surveys

Aerial surveys and ground surveys are conducted annually throughout the State. Recently there was very little activity from defoliating insects or declines. In 2008, forest insect populations were at very low levels, including gypsy moth and spruce budworm. Only 600 acres of browntail moth defoliation and 650 acres of beech bark disease damage were observed during the aerial survey, along with isolated areas of impact from balsam woolly adelgid.

This map delineates aerial detection survey (ADS) results for Maine in 2007 and 2008.





## Forest Damage

### Special Issues

**Hemlock woolly adelgid** was first detected in native hemlocks in Maine in 2003. Forest infestations have been found scattered over approximately 15,000 acres in York County, the southernmost tip of the State, in the towns of Kittery, Wells, York, Eliot, and South Berwick. Populations continue to thrive within the previously infested area. Two new spot infestations have been found outside the core infested area in the towns of Saco and Kennebunkport. Intensive delimiting surveys are underway and are planned for 2009. In addition, infested out-planted nursery stock was reported in South Portland. The Maine Forest Service plans to work with the Maine Department of Agriculture to eradicate this infestation.

Biological control establishment efforts continue in Maine. In 2008, *Sasajiscymnus tsugae* and *Laricobius nigrinus* beetles were released in York County. For the first time, an *S. tsugae* adult was recovered from a previous release site in York. Additionally, *S. tsugae* adults and larvae continue to be recovered at a release site on Gerrish Island in Kittery. The State has implemented a "Take a Stand" effort to train foresters and landowners to identify the adelgid and monitor the hemlock on their property to assist in the overall survey effort.



Foresters and landowners are trained to identify hemlock woolly adelgid in the "Take a Stand" program.

Long-term plots in hardwood stands damaged by the **ice storm** of 1998 were reexamined in 2008. While crown damage to affected trees has largely been masked now by healthy recovery in most instances, more significant damage is now becoming evident in some particular cases. Plots were located across the most severely damaged regions of southern and central Maine. Examination of one particular site in southwestern Maine has revealed that ash trees that had moderate top damage are now declining and dying from infection by *Armillaria* root rot. While the most dramatic effects have been observed in ash, other species that were damaged by the ice storm are also experiencing increasing losses from internal decay, root rots, and other defects. Another ice storm caused significant damage to trees in southern Maine in December 2008.

Observations made in Aroostook County and in localized areas throughout central Maine have indicated some substantial branch and stem breakage to natural and plantation conifer regeneration. This damage was the result of the **heavy snow loads** during the 2007-2008 winter seasons. In some northern areas, snow accumulations exceeded 200 inches for the season, with many areas receiving in excess of 150 inches. Red pine was considered the most damaged plantation species.



Forest Health Specialists gathered to assess the efficacy of biocontrol of the adelgid in a hemlock stand.

Monitoring for **emerald ash borer**, which is causing significant mortality to ash in the Midwestern States, was carried out in central and southwestern Maine using both purple prism traps at 13 locations and biosurveillance with *Cerceris fumipennis* at two locations. No borers were detected using either method. The *Cerceris* wasp is used in biosurveillance since it actually "captures" a variety of boring insects and carries them back to their nests, which can then be collected for laboratory identification. Over 30 *Cerceris* colonies were found in 2008, of which at least 13 will be suitable for biosurveillance in 2009.



Workshop participants learned to locate *Cerceris* colonies to use as biosurveillance for the emerald ash borer.

## Defoliators

The **browntail moth** population in Maine was low and spotty in most locations in 2008. Defoliation visible from the air was restricted to 643 acres in Bath, Brunswick, Topsham, and West Bath, at the southern terminus of Merry Meeting Bay. The populations were high enough to cause considerable allergic distress to residents. There was some private ground treatment and more is expected in 2009. The browntail moths are primarily in red oaks in this area, and chemical control is the only viable option other than cutting trees, which some homeowners are opting to do. Populations will continue to be monitored.

**Spruce budworm** populations are still very low. Pheromone trap catches dropped in 2008 to an average of 1.7 moths per site with traps catches in the western part of the State decreasing. No

larval activity or defoliation was observed during field surveys. The Maine Forest Service will continue to monitor this periodic serious pest.

No defoliation of hardwoods resulting from **gypsy moth** larval feeding was recorded in 2008. The 2008 fall egg mass survey in the infested area indicates that the population will remain at endemic levels next season. Two hundred eighty-one pheromone traps were set in towns adjacent to the gypsy moth quarantine zone (transition zone), and these traps captured approximately 3,500 male moths. Seventy-two percent of the traps in the transition zone had fewer than 20 male moths. With the exception of a few towns, catches at sites that had traps in the past were down compared to the previous year. Egg mass scouting is underway in towns with high male moth catches. To date, egg masses have been found in Piscataquis County and Penobscot County.

**Winter moth** males have been positively identified from pheromone traps set out in 2005 and 2006. No larvae, females, or defoliation have been found to date.

## Other Insect Pests

**Arborvitae leaf miners** are a perennial problem whose populations appear to be on the rise again. Cedar stands across northern and eastern Maine continue to be thin and off color due to a variety of factors, including arborvitae leaf miner.

Pockets of dead and dying larch infested with the **eastern larch beetle** have been common since the mid 1970s and continue to be a common sight throughout the range of larch in Maine. Stands of larch in southern and central portions of the State exhibit the highest mortality. Most tree mortality is generally associated with other stress factors, particularly extremes in water availability.

**Balsam woolly adelgid** populations continued at low levels in 2008. While mortality from past years is striking, the consistent rainfall of 2004 through 2007, coupled with low population levels of the adelgid, allowed a number of the light- to moderately-damaged trees to recover.



There is a State and Federal quarantine on **pine shoot beetle** and its host pine tree in all Maine counties except Aroostook and Washington, where no beetles have been caught. The Maine Forest Service and USDA APHIS Plant Protection Quarantine conduct trapping to monitor the spread of pine shoot beetle in unregulated counties. To monitor population trends, the Maine Forest Service trapped several sites again that had yielded pine shoot beetle in previous years, as well as some sites in surrounding towns. No evidence of pine shoot beetle damage was found. Where it is established, populations of pine shoot beetle remain low and below damage thresholds.

## Diseases

**Anthracnose** diseases generally caused only light damage to hardwood foliage during 2008. Maple anthracnose, caused by the pathogen *Kabatiella apocrypta*, was found in Androscoggin, Lincoln, Kennebec, and Cumberland Counties. Damage was considered to be moderate to light on red and sugar maples. The most noticeable anthracnose damage occurred on ash, resulting from infection by *Gnomoniella fraxini*.



Tree samples are examined at the Maine Forest Service Diagnostic Lab to determine damage.

**Ash leaf rust** was reported from Hancock County and was likely present in other mid-coast and southern coastal communities. The first indication of infections occurred during the first week in June. The alternate hosts of this rust are species of salt marsh grasses in the genus *Spartina*. Significant defoliation from this disease has not occurred since the mid to late 1990s.

An unusual occurrence of *Cytospora canker* was observed on an ornamental Norway maple in Yarmouth in Cumberland County. The pathogen was found infecting numerous branches of a tree that had severe mechanical injuries in the root crown region. *Cytospora canker* is more commonly found on aspen, poplars, and willows, but can occur on a variety of maples, birches, ashes, and elms as well.

Several **needle cast diseases of balsam fir** were common in forest areas, landscape plantings, and Christmas tree plantations. *Lirula nervata* was observed from Lincoln and Kennebec Counties, but this and the other needle cast fungi are known to occur throughout the State. These diseases are usually not seriously damaging to the long-term health of trees in forest or landscape settings, but can be an especially significant problem for Christmas tree growers.

**Marssonina leaf spot** of aspen has been found on Islesboro in Waldo County, where considerable leaf damage occurred during 2008. Occurrence of the disease is common and widespread throughout Maine, although damage is rarely of any significance. Heavy infection levels in coastal areas are likely the result of extended periods of rain, fog, and high humidity.

**Diplodia tip blight** continues to cause significant damage to pine throughout Maine. The wet spring and summer seasons during the past several years have allowed the development of high inoculum levels, especially in plantations and roadside plantings.

The pathogen ***Heterobasidion annosum*** (= *Fomes annosus*) is a common problem throughout Maine, with most damage occurring in red pine plantations. The fungus is an aggressive root rot pathogen and often becomes established in red pine plantations after early stand thinning has taken place.

*Ceratocystis virescens*, the primary causal agent of **sapstreak disease**, was isolated from the roots of declining sugar maples from a sugarbush in Aroostook County. The pathogen is also a common saprophyte on freshly-cut stems of several hardwood species. The affected sugarbush had been recently established, with partial harvesting removal of selected trees over the past few years.

While the long-term damage from *Rhizosphaera kalkhoffii* needle cast continues to be significant, trees are recovering from the devastating years of 2004 through 2006. White spruce and Colorado blue spruce in particular were heavily damaged during that period from excessive needle loss caused by this disease.

The quarantine for **European larch canker** continues in the Downeast portion of the State, including Washington County and eastern Hancock County, and along the mid-coast in Kennebec, Knox, Lincoln, Sagadahoc, and Waldo Counties. The canker was first found in Maine in 1981 during a survey that was prompted by reports that the disease had been identified in the Canadian Maritimes Provinces of New Brunswick and Nova Scotia. An eradication project is currently underway to eliminate a new isolated find on a golf course near Brunswick, at the western edge of the quarantine, in cooperation with the Maine Forest Service and the landowner.



Larch canker-infected logs were cut and chipped in Brunswick to eradicate the disease.

Localized severe incidence of **tar spot** on Norway maples was noted in several coastal communities in Hancock and Knox County. The heaviest damage appeared to be restricted to a narrow shoreland zone. Light infections of this leaf spot were reported from many towns in central and southern Maine. Although tar spot is aesthetically damaging to ornamentals, even severely affected trees are expected to recover fully next spring.

Symptoms of **Verticillium wilt** of maples were observed in particularly high levels in Androscoggin and Penobscot Counties. Trees in many other areas, including Kennebec, Lincoln, Aroostook, and Sagadahoc Counties, have also been seen with symptoms attributed to *Verticillium* infection. Norway maples were most damaged by the disease, but red and sugar maples were also occasionally affected.



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